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CENTRAL INTELLIGENCE AGENCY

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SUBJECT New Type of Concrete in Use in the USSR/Dolomite Cement

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25X1X THIS IS UNEVALUATED INFORMATION

- 25X1 1. [redacted] in Soviet construction and particularly in marine construction continuous efforts are being made to develop new methods which will be more advanced both technically and economically. In the present report, which will augment reports [redacted] on the "Glavmorstroy" Division of the Merchant Marine Ministry, [redacted] necessary to report on a new economical-type of concrete which has now begun to be used in USSR construction projects. [redacted]
- 25X1 2. It is known that reinforced concrete is the most durable and widely used type of construction material. However this material requires a large quantity of iron reinforcement. Any reduction in metal consumption on reinforced concrete construction in large building projects is of enormous importance. In the USSR, the effort to solve this problem has been carried on in two directions: improvements in construction techniques and in the use of higher grades of steel.
- 25X1 3. It has been proven that the effect of using highly durable metals rather than ordinary grades more than makes up the difference in their costs. By using high-quality steel in assembling the reinforcements it is possible to use five and even six times less metal.
- 25X1 4. In this connection it is highly interesting to note the use of a new development in reinforced concrete construction wherein bar iron, which is usually used in making concrete reinforcements, is replaced by wire. Let us take a look at the

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advantages of the new type of reinforced concrete. In assembling a reinforcing structure of the required dimensions and configurations it is necessary to take the metal arriving in coils from the factory and straighten, cut, bend, weld and set it in forms around which to pour the concrete. In the USSR around 1933-1934, so-called pre-stressed reinforced concrete, highly esteemed in its day by contractors, began to appear in construction projects. However, this method was greatly complicated by the difficulties met in assembling the reinforcing structure, for it had to drawn to strictly fixed stresses. There was only enough machinery specialized for this process to handle 5-10 thousand cubic meters (12-24 thousand tons) of annual production.

5. Scientists continued to work assiduously over improvements in the pre-stressed reinforcing method, and the result of this work in recent years has been the development of wire reinforced concrete. The appearance of wire reinforced concrete has completely solved the problem of wide application of pre-stressed reinforcing on construction projects. The fundamental error of all researchers and builders who have worked in this field has been their attachment until recently to an obsolete form of the reinforced structure which consisted of threaded bars.
6. Wire reinforced concrete presents the appearance of a structure reinforced by a continuous tightly-stretched wire, arranged in all directions with all sorts of knots and configurations.
7. Wire reinforced concrete is significantly more economical than concrete reinforced in the old way; five times less metal is consumed. There is also a great saving in labor costs, the new method requiring six to 15 times less man-hours.
8. According to the 5th Five-Year Plan, 80 thousand tons of high-quality wire are to be delivered for use in wire reinforced concrete construction. This quantity of wire will make it possible to economize up to 400 thousand tons of metal in a year. This significant reduction in consumption of metal and labor will make it possible to reduce by 300 million rubles annually, construction costs in those projects where wire reinforced concrete is used.
9. A number of types of machines to be used in continuous wire reinforcing have already been created by builders in the Central Scientific-Research Institute for Industrial Construction and the Experimental Scientific-Research Institute for Machinery and Machine Tools. Experiments conducted at the Moscow plant "Stroitel'" and other national enterprises indicate that high productivity and economy can be obtained in preparing wire reinforcing.
10. According to the 5th Five Year Plan 100 wire-coiling machines will be produced for use in preparing wire reinforcing.
11. The Soviet press recently [1952] carried an article to the effect that Professor Berg, chief of the Physical Chemistry Sector of the Chemical Institute of the Kazan Academy of Sciences Affiliate, has developed a method for utilizing dolomite as a raw material for cement.
12. This work is useful at the present time because large construction projects require a great increase in the production of new, high-quality ornamental and facing materials, individual parts and entire structures prepared at the factory. In practice, Professor Berg's method consists of the following: a technique has been developed for calcining granulated dolomite in rotary kilns. The presence of magnesium carbonate ( $MgCO_3$ ) in the dolomite produces cement after calcining. The most varied building materials can be made from it. Window sills and staircase steps can be manufactured from magnesian cement by adding marble aggregate. Compounded with various fillers, dolomite cement provides cheap, light and durable materials such as xylolith and fibrolite. Xylolith can be made by adding sawdust, wood powder or peat, while for fibrolite, wood shavings, wood fibers and hemp may be used. Xylolith can be used in buildings for trim as well as for walls and floors. It has low heat and sound conductivity, good heat resistance, does not create dust and has an attractive outward appearance.
13. Dolomite cement, when mixed with sand to form concrete also serves as exterior stucco as it is durable and rapid-drying. It can be widely utilized in roofing.

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14. Dolomite cement will facilitate the construction of standardized one-story houses. Such buildings can be put up with pre-cast blocks or by pouring in wall moulds. The roof and floors will be precast of the same materials. This will open up possibilities of exploiting local dolomite deposits for construction needs.
15. First experiments in utilizing various forms of dolomite cement were begun in construction projects in the city of Kazan'.

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